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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/801,204 | 03/15/2004 | Boon Keat Tan | 70040131-1 | 3118 |
| 57299 | 7590 | 09/24/2007 | EXAMINER | |
| Kathy Manke Avago Technologies Limited 4380 Ziegler Road Fort Collins, CO 80525 | | | | NGUYEN, LUONG TRUNG |
| ART UNIT | | PAPER NUMBER | | |
| | | 2622 | | |
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| 09/24/2007 | | | ELECTRONIC | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

avagoip@system.foundationip.com
kathy.manke@avagotech.com
scott.weitzel@avagotech.com

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/801,204 | TAN ET AL. | |
| | Examiner | Art Unit | |
| | LUONG T. NGUYEN | 2622 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 11 July 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-9 and 11-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 24 June 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/27/04</u> . | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I (Figure 3) and Figure 2A, which read on claims 1, 2, 6-9, 11, 13-16 and 18-21 in the reply filed on 7/11/2007 is acknowledged. The traversal is on the ground(s) that the Applicants do not understand the rationale for the requirement to elect one of Figures 2A, 2B and 2C. After reviewing the application, the requirement of electing Figures 2A, 2B and 2C has been withdrawn. The application is examined with elected Species I (Figure 3) reads on claims 1-9 and 11-21.

2. Claim 10 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/11/2007.

Claim Objections

3. Claims 4, 17 are objected to because of the following informalities:

Claim 4 (line 7), "an color sensor" should be changed to --a color sensor--.

Claim 17 (line 4), "said differential circuit" should be changed to --said differential amplifier circuit--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 6-9, 13-16, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al. (US 5,329,111).

Regarding claim 1, Sonoda et al. discloses a color sensor comprising:

a color sensor circuit produces photocurrent from a color component of a light input, wherein said color sensor circuit outputs a first voltage indicating intensity of said color component (voltage indicating intensity of R color signal outputted from amplifier 2 and entered differential amplification circuit 8 via resistor 8d, figure 7, column 1, lines 10-67);

a dark color sensor circuit for producing dark photocurrent and outputting a second voltage indicating an offset voltage (dark voltage corresponds with R color signal is held in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

a differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) coupled to said color sensor circuit and to said dark color sensor circuit, for receiving said first and second voltages and outputting a final output canceling contributions of said offset voltage in said first voltage due to said dark photocurrent.

Regarding claim 4, Sonoda et al. discloses wherein said differential amplifier circuit comprises:

a difference amplifier (differential amplifier 8a, figure 7, column 1, lines 10-67)

comprising an output for outputting said final output; a positive input, and a negative input;

a feedback resistor (resistor 8b, figure 7, column 1, lines 47-67) having a resistor value with one end coupled to said negative input and another end coupled to said output;

a first resistor (resistor 8d, figure 7) having said resistor value coupled in series with a color sensor output outputting said first voltage and said negative input;

a second resistor (resistor 8c, figure 7) having said resistor value coupled in series with a dark sensor output of said dark sensor circuit outputting said second voltage and said positive voltage;

a third resistor (resistor 8e, figure 7) having said resistor value coupled in series to said positive input and to ground.

Regarding claims 6, 13, 19, Sonoda et al. discloses wherein said color component comprises red (figures 6-7, column 1, lines 10-67).

Regarding claims 7, 14, 20, Sonoda et al. discloses wherein said color component comprises green (figures 6-7, column 1, lines 10-67).

Regarding claims 8, 15, 21, Sonoda et al. discloses wherein said color component comprises blue (figures 6-7, column 1, lines 10-67).

Regarding claim 9, Sonoda et al. discloses a color sensor comprising:

a plurality of color sensor circuits, each producing photocurrent from a respective color component of a light input, and each outputting an associated voltage indicating intensity of said respective color component (voltage indicating intensity of R color signal outputted from amplifier 2 and entered differential amplification circuit 8; voltage indicating intensity of G color signal outputted from amplifier 3 and entered differential amplification circuit 9; voltage indicating intensity of B color signal outputted from amplifier 4 and entered differential amplification circuit 10; figure 7, column 1, lines 10-67);

a dark color sensor circuit for producing dark photocurrent and outputting an offset voltage (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

at least one differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) coupled to said plurality of color sensor circuits and to said dark color sensor circuit for receiving said associated voltage and said offset voltage and outputting a final output canceling contributions of said offset voltage due to said dark photocurrent in said voltage of said respective color component.

As for claim 16, claim 16 is a method claim of apparatus claim 1. Therefore, see Examiner's comments regarding claim 1.

As for claim 18, claim 18 is a method claim of apparatus claim 9. Therefore, see Examiner's comments regarding claim 9.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3, 11-12, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111) in view of Nagasaki et al. (US 5,502,488) further in view of Nelson et al. (US 5,508,507).

Regarding claims 2-3, 11-12, Sonoda et al. fails to specifically discloses a sensor circuit comprises:

a transimpedance amplifier including an output for outputting said first voltage, a negative input, and a positive input;

a feedback resistor with one end coupled to said output and another end coupled to said negative input;

a photodetector for detecting said photocurrent of said color component including a photodetector input coupled to ground and to said positive input, and a photodetector output coupled to said negative input.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However, Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

Regarding claim 17, Sonoda et al. fails to discloses matching a resistor value for resistors in a differential amplifier circuit, to a resistance of a feedback resistor in a color sensor circuit

used to measure said first voltage, wherein said differential amplifier circuit receives said first voltage and said offset voltage and outputs said final voltage.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However, Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Noted that figure 3 shows a matching a resistor value of feedback resistor 54 to resistance of compensator capacitor 56. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111).

Regarding claim 5, Sonoda et al. fails to specifically disclose wherein said resistor value approximates resistance of a feedback resistor in said color sensor circuit. However, Official Notice is taken that it is well known in the art to set the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal stable.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Suzuki et al. (US 5,677,940) discloses digital X-ray imaging apparatus.

Hoiser et al. (US 6,445,413) discloses system for determining a video offset from dark photosensors in an image sensor array.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LN
09/05/07

Luongt. Nguyen

LUONGT. NGUYEN
PATENT EXAMINER